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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/989,960	11/21/2001	Rickie C. Lake	MI40-338	2333

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EXAMINER	
HARAN, JOHN T	
ART UNIT	**PAPER NUMBER**
1733	

DATE MAILED: 03/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/989,960	LAKE, RICKIE C.	
	Examiner	Art Unit	
	John T. Haran	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29-49 and 51-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29-49 and 51-62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/27/04 has been entered.

Specification

2. The disclosure is objected to because of the following informalities: the section titled Related Patent Data should be amended to indicate that 09/022,812 is now U.S. Patent 6,030,423.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 58, 60, and 62 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The requirement that the conductive adhesive mass comprises only four components in claims 58, 60, and 62 constitutes new matter. The specification indicates that it is preferred that the curable adhesive composition **comprises** a two-part epoxy resin and hardener system (page 5, lines 16-19) and also has an epoxy-terminated silane, such as glycidoxypropyltrimethoxysilane in an amount less than or equal to about 2% by weight (page 5, lines 19-24). The specification then cites an example of the above mentioned preferred adhesive composition that is formed by mixing a specific silane, a specific silver epoxy resin (resin filled with conductive filler), and a specific hardener (page 6, lines 1-12). It is noted that the specification mentions the preferred curable adhesive composition **comprises** (page 5, lines 16-17) the listed components which is open language and does not impose any restrictions on the makeup of the composition. There is no language indicating that the composition consists of or is restricted to only having four components. Furthermore the disclosure would not convey to one skilled in the art that Applicant had possession of or the intent of excluding the adhesive composition from including anything other four components at the time the application was filed.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 58, 60, and 62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 58, 60, and 62 the phrase "comprising only four components" renders the claim indefinite because transitions phrases are supposed to convey the scope of the claim and the wording "comprising only" is confusing (See MPEP 2111.03). Comprising is considered open language and unrestrictive, however the word "only" implies closed language and is restrictive and the phrasing "comprising only" renders the claim unclear because the scope of the claim is uncertain. It appears that Applicant intends to use closed language which is better accomplished by using appropriate closed language, such as - - consisting - -. However, as noted above, such closed language is considered to be new matter.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 45-47 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kropp et al (U.S. Patent 5,362,421) in view of Tuttle (U.S. Patent 5,558,679).

Kropp et al disclose a method of conductively interconnecting electronic components by interposing a curable, electrically conductive adhesive composition comprising an epoxy with a glycidoxypropyltrimethoxysilane coupling agent between a first and second electronic component and then curing the adhesive to create an electrically conductive bond that electrically interconnects the first and second

components (Abstract, Column 6, lines 1-8). Kropp et al is silent towards one of the electronic components to have a nickel containing metal surface cover.

One skilled in the art would have readily appreciated that it is well known and conventional to electrically interconnect electronic components via an epoxy adhesive wherein one of the electronic components has a metal surface containing nickel, as shown for example in Tuttle (Column 3, lines 60-61), and that Kropp et al are a general teaching for interconnecting electronic parts. It would have been obvious to one of ordinary skill in the art at the time the invention was made to connect an electrical component with a nickel containing metal surface to another electrical component in Kropp et al as suggested in Tuttle.

Regarding claim 61, one skilled in the art would have readily appreciated that the conductive adhesive provides a physical connection as well as an electrical connection.

8. Claims 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kropp et al in view of Tuttle as applied to claim 45 above, and further in view of Chen et al (U.S. Patent 4,975,221).

Regarding claims 48 and 49, Kropp et al is silent towards the weight percent of epoxy terminated silane, however it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the desired weight percentages of the epoxy terminated silane in the adhesive composition in the method of Kropp et al and only the expected results would be achieved. Furthermore, it is known to have epoxy terminated silane in the specified amounts in an electrically conductive epoxy

adhesive, as shown for example in Chen et al (Column 4, lines 1-22) and it would have been obvious to use conventional amounts of adhesion promoter in Kropp et al.

9. Claims 45, 48-49, and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (U.S. Patent 4,975,221) in view of Tuttle (U.S. Patent 5,558,679).

Chen et al discloses a curable epoxy adhesive for use in attaching electrical components together, such as semiconductor die or chips to a substrate, to form a connection wherein the epoxy adhesive contains an electrically conductive filler and an epoxy functional silane adhesion promoter (Column 1, lines 5-11 and Column 3, line 59 to Column 4, line 5).

One skilled in the art would have readily appreciated that it is well known and conventional to electrically interconnect electronic components via an epoxy adhesive wherein one of the electronic components has a metal surface containing nickel, as shown for example in Tuttle (Column 3, lines 60-61), and that Chen et al are a general teaching for interconnecting electronic parts. It would have been obvious to one of ordinary skill in the art at the time the invention was made to connect an electrical component with a nickel containing metal surface to another electrical component in Chen et al as suggested in Tuttle.

Regarding claims 48 and 49, Chen et al teach having the adhesion promoter be 0 to 2 percent by weight (Column 4, lines 15-20).

Regarding claim 61, one skilled in the art would have readily appreciated that the conductive adhesive provides a physical connection as well as an electrical connection.

9. Claims 46-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (U.S. Patent 4,975,221) in view of Tuttle as applied above in claim 45 and further in view of Tsukagoshi et al (U.S. Patent 5,843,251), Kropp et al (U.S. Patent 5,362,421), or Inoue et al (U.S. Patent 5,728,473).

Chen et al are silent towards the type of silane utilized as the adhesion promoter, however Chen et al do teach any type of epoxy terminated silanes are suitable as the adhesion promoter (Column 4, lines 4-5).

Glycidoxy methoxy silanes are well known and conventional adhesion promoters/coupling agents, as evidenced for example in Tsukagoshi et al, Kropp et al, and Inoue et al. Tsukagoshi et al is directed to a method for electrically connecting circuits by interposing an epoxy adhesive between two circuits (Column 3, lines 30-35). The reference teaches adding a silane coupling agent to the epoxy in order to strengthening the adhesive interface of the circuits and to improve moisture resistance, such as glycidoxypropyltrimethoxysilane (Column 10, line 62 to Column 11, line 12). Kropp et al also teach adding a silane coupling agent to a curable, electrically conductive epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic parts (Abstract, Column 6, lines 1-9). Inoue et al also teach adding a silane coupling agent to a curable epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic components. It would have been obvious to one of ordinary

skill in the art at the time the invention was made to utilize a known silane adhesion promoter, such as glycidoxypropyltrimethoxysilane, in the epoxy adhesive in the method of Chen et al.

10. Claims 29, 32-36, 51-52, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (U.S. Patent 5,558,679) in view of Chen et al (U.S. Patent 4,975,221).

Tuttle is directed to a method for mounting a battery on a substrate wherein a thin profile batter is mounted on a substrate with at least one node location and is electrically interconnected to the substrate and node with an electrically conductive epoxy (Column 2, line 63 to Column 3, line 29). Tuttle is silent towards the epoxy adhesive having a terminated silane.

It is well known and conventional to include epoxy terminated silanes adhesion promoters in adhesives when bonding together electrical components in order to ensure better adhesion, as shown for example in Chen et al. Chen et al discloses a curable epoxy adhesive for use in attaching electrical components together to form a connection wherein the epoxy adhesive contains an electrically conductive filler and an epoxy functional silane adhesion promoter (Column 1, lines 5-11 and Column 3, line 59 to Column 4, line 5). One skilled in the art would have readily appreciated including well known adhesion promoters, such as epoxy terminated silanes, for use in ensuring adequate adhesion between electrical components as is conventional in the art, in the adhesive of Tuttle. It would have been obvious to one of ordinary skill in the art at the

time the invention was made to include epoxy terminated silanes in the adhesive of Tuttle in order to promote adhesion.

Regarding claims 32 and 33, one skilled in the art would have readily appreciated that adhesion promoters, such as epoxy terminated silanes, comprise a small weight percentage as shown in Chen et al teach including the adhesion promoter in an amount of 0% to 2% by weight (Column 4, lines 16-21). It would have been obvious for the weight percent to be less than or equal to 2% or 1% by weight.

Regarding claims 34-36, Tuttle teaches a button type battery with a terminal housing of nickel clad stainless steel (Column 3, lines 55-61). Tuttle also teaches the conductive traces are screen printed on the substrate (Column 5, lines 4-5), however is silent towards them being conductive ink. It is well known and conventional to use conductive ink as traces and it would have been obvious to do so in apparatus of Tuttle.

Regarding claims 51 and 52, Applicant teaches that the concentration of silane in an epoxy terminated silane lowers the resistance of the adhesive and thereby lowers the contact resistance through a metal surface (Specification, page 6, line 15 to page 7 line 10). While Chen and Tuttle are silent towards the epoxy having an effective metal surface wetting concentration of silane that results in a contact resistance through the metal surface of less than or equal to about .032 ohm-cm2, Chen et al disclose the composition of the epoxy adhesive listing each component in terms of part by weight (See Column 4, lines 15-21). Applicant teaches that the effective concentration of the silane needed to obtain the desired contact resistances is less than 2% by weight and preferably less than 1% by weight (Specification, page 6, line 15 to page 7 line 10). It is

clear from the composition listing in Chen et al that the adhesion promoter (epoxy functional silane) comprises less than 1% by weight. One skilled in the art would have readily appreciated that the concentration of silane taught in the adhesive of Chen et al is within the effective concentration range taught by Applicant and that therefore it would be expected for the adhesive of Tuttle, as modified above to have adhesion promoter in the amounts suggested by Chen et al, to have a contact resistance of the desired values (i.e. less than 0.16, or 0.032 ohm-cm2).

Regarding claim 57, one skilled in the art would have readily appreciated that the conductive adhesive provides a physical connection as well as an electrical connection.

11. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (U.S. Patent 5,558,679) in view of Chen et al (U.S. Patent 4,975,221) as applied to claim 29 above, and further in view of Tsukagoshi et al (U.S. Patent 5,843,251), Kropp et al (U.S. Patent 5,362,421), or Inoue et al (U.S. Patent 5,728,473).

Tuttle and Chen et al are silent towards the type of silane utilized as the adhesion promoter, however Chen et al do teach any type of epoxy terminated silanes are suitable as the adhesion promoter (Column 4, lines 4-5).

Glycidoxy methoxy silanes are well known and conventional adhesion coupling/coupling agents, as evidenced for example in Tsukagoshi et al, Kropp et al, and Inoue et al. Tsukagoshi et al is directed to a method for electrically connecting circuits by interposing an epoxy adhesive between two circuits (Column 3, lines 30-35). The reference teaches adding a silane coupling agent to the epoxy in order to

strengthening the adhesive interface of the circuits and to improve moisture resistance, such as glycidoxypropyltrimethoxysilane (Column 10, line 62 to Column 11, line 12). Kropp et al also teach adding a silane coupling agent to a curable, electrically conductive epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic parts (Abstract, Column 6, lines 1-9). Inoue et al also teach adding a silane coupling agent to a curable epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic components.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a known silane adhesion promoter, such as glycidoxypropyltrimethoxysilane, in the epoxy adhesive of Tuttle.

12. Claims 37, 40-44, 53-56, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (U.S. Patent 5,558,679) in view of Chen et al (U.S. Patent 4,975,221) as applied to claim 29 above, and further in view of Tuttle (U.S. Patent 5,646,592).

Tuttle '679 is silent towards the substrate to which the battery is bonded has conductive paths including an antenna and an integrated circuit chip mounted also mounted on the substrate to create a radio frequency device.

It is well known and conventional in the radio frequency device art to have a substrate with a conductive path including an antenna, an integrated circuit chip mounted to the substrate in electrical connection with a first portion of the substrate conductive paths and a battery mounted over and in electrical connection with a second

portion of the conductive paths, as shown for example in Tuttle '592 (Column 2, lines 50-57; Column 3, lines 27-30). One skilled in the art would have readily appreciated using known substrates to which batteries are electrically connected in the method of Tuttle '679. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the substrate of Tuttle '592 in the product of Tuttle '679, as modified above to have an epoxy terminated silane adhesion promoter.

Regarding claims 40 and 41, one skilled in the art would have readily appreciated that adhesion promoters, such as epoxy terminated silanes, comprise a small weight percentage as shown in Chen et al teach including the adhesion promoter in an amount of 0% to 2% by weight (Column 4, lines 16-21). It would have been obvious for the weight percent to be less than or equal to 2% or 1% by weight.

Regarding claims 42-44, Tuttle '679 teaches a button type battery with a terminal housing of nickel clad stainless steel (Column 3, lines 55-61). Tuttle also teaches the conductive traces are screen printed on the substrate (Column 5, lines 4-5), however is silent towards them being conductive ink. It is well known and conventional to use conductive ink as traces and it would have been obvious to do so in Tuttle '679, as modified above.

Regarding claims 53-56, Applicant teaches that the concentration of silane in an epoxy terminated silane lowers the resistance of the adhesive and thereby lowers the contact resistance through a metal surface (Specification, page 6, line 15 to page 7 line 10). While Chen and Tuttle are silent towards the epoxy having an effective metal surface wetting concentration of silane that results in a contact resistance through the

metal surface of less than or equal to about .032 ohm-cm2, Chen et al disclose the composition of the epoxy adhesive listing each component in terms of part by weight (See Column 4, lines 15-21). Applicant teaches that the effective concentration of the silane needed to obtain the desired contact resistances is less than 2% by weight and preferably less than 1% by weight (Specification, page 6, line 15 to page 7 line 10). It is clear from the composition listing in Chen et al that the adhesion promoter (epoxy functional silane) comprises less than 1% by weight. One skilled in the art would have readily appreciated that the concentration of silane taught in the adhesive of Chen et al is within the effective concentration range taught by Applicant and that therefore it would be expected for the adhesive of Tuttle '679, as modified above to have adhesion promoter in the amounts suggested by Chen et al, to have a contact resistance of the desired values (i.e. less than 0.16, or 0.032 ohm-cm2).

Regarding claim 59, one skilled in the art would have readily appreciated that the conductive adhesive provides a physical connection as well as an electrical connection.

13. Claims 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuttle (U.S. Patent 5,558,679) in view of Chen et al (U.S. Patent 4,975,221) as applied to claim 29 above, and further in view of Tuttle (U.S. Patent 5,646,592), as applied to claim 37 above, and further in view of Tsukagoshi et al (U.S. Patent 5,843,251), Kropp et al (U.S. Patent 5,362,421), or Inoue et al (U.S. Patent 5,728,473).

Tuttle'679 and Chen et al are silent towards the type of silane utilized as the adhesion promoter, however Chen et al do teach any type of epoxy terminated silanes are suitable as the adhesion promoter (Column 4, lines 4-5).

Glycidoxy methoxy silanes are well known and conventional adhesion coupling/coupling agents, as evidenced for example in Tsukagoshi et al, Kropp et al, and Inoue et al. Tsukagoshi et al is directed to a method for electrically connecting circuits by interposing an epoxy adhesive between two circuits (Column 3, lines 30-35). The reference teaches adding a silane coupling agent to the epoxy in order to strengthening the adhesive interface of the circuits and to improve moisture resistance, such as glycidoxypropyltrimethoxysilane (Column 10, line 62 to Column 11, line 12). Kropp et al also teach adding a silane coupling agent to a curable, electrically conductive epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic parts (Abstract, Column 6, lines 1-9). Inoue et al also teach adding a silane coupling agent to a curable epoxy adhesive such as glycidoxypropyltrimethoxysilane for interconnecting electronic components.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a known silane adhesion promoter, such as glycidoxypropyltrimethoxysilane, in the epoxy adhesive of Tuttle '679, as modified above.

Response to Arguments

14. The declaration under 37 CFR 1.132 filed 1/27/04 is insufficient to overcome the rejection of the claims. It appears the declaration is asserting unexpected results with

using silane additives to a conductive epoxy when bonding to a nickel surface or to a battery because it increased the wetting characteristics and thereby improved conductivity (see paragraphs 6 and 7). However there is no proof that an electrically conductive epoxy adhesive with silane additives has better electrical conductivity with a nickel surface or battery than the electrically conductive epoxy adhesives that were previously used to bond to a nickel surface or battery as disclosed in Tuttle '679. A comparison of the electrical conductivity of the claimed conductive epoxy adhesive with silane additives bonded to a nickel surface or a battery with the conductive epoxy adhesive of the prior art (Tuttle '679) bonded to a nickel surface or a battery which demonstrates the unexpectedly higher conductivity with the epoxy terminated silane would be sufficient to overcome the 103(a) rejections of the claims. Absent, such a showing of unexpected results, one skilled in the art would have been motivated to use known conductive epoxy resins with known adhesion promoters in the claimed embodiments.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John T. Haran** whose telephone number is **(571) 272-1217**. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone

number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John T. Haran
Examiner
Art Unit 1733